



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Donald R. Van Der Moere

EXAMINER: Ernesto Garcia

APPL. NO.: 10/802,984

GROUP ART UNIT: 3679

FILED: March 17, 2004

ATTY DKT NO.: D5270

TITLE: COATED PISTON PIN

**CERTIFICATE OF FIRST CLASS MAILING UNDER 37 C.F.R. §1.8(a)**

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February 22, 2007  
Date

Susan L. Lukasik  
Susan L. Lukasik

Commissioner for Patents  
Box 1450  
Alexandria, VA 22313-1450

**APPEAL BRIEF TRANSMITTAL LETTER**

Dear Sir:

Transmitted herewith is an Appeal Brief under 37 C.F.R. §41.37 for the above captioned patent application. The fee required under 37 C.F.R. 41.20(b)(2) is **\$500.00**. The Director is hereby authorized to charge any fees that may be required, or credit any overpayment, to **Deposit Account No. 14-0603**. One additional copy of this sheet is enclosed.

Respectfully submitted,

Date: February 21, 2007

By:

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Susan L. Lukasik  
Susan L. Lukasik

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

The corrected Appeal Brief is presented in response to a notification of Non-Compliant Appeal Brief mailed on January 25, 2007.

**APPEAL BRIEF UNDER 37 C.F.R. §41.37****I. REAL PARTY IN INTEREST**

International Engine Intellectual Property Company, LLC is the assignee of the present invention.

**II. RELATED APPEALS AND INTERFERENCES**

None known.

**III. STATUS OF CLAIMS**

This application was filed with twenty-one (21) claims, and claims 2, 9, and 16 were cancelled during prosecution. Claims 1, 3-8, 10-15, and 17-21 are pending and stand twice rejected. The rejections of claims 1, 3-8, 10-15, and 17-21 are appealed.

#### **IV. STATUS OF AMENDMENTS**

Two amendments after final were filed by Applicant, but only the Amendment/Response filed by Applicant on June 19, 2006 was entered. Applicant filed a Request for Continued Examination on July 6, 2006. A non-final Office Action was mailed on July 27, 2006. A notice of appeal was filed by Applicant in response to the July 27, 2006 Office Action.

#### **V. SUMMARY OF CLAIMED SUBJECT MATTER**

##### **A. Brief Summary**

The present invention generally relates to a piston pin (10) having a piston pin exterior margin, the exterior margin of the piston pin (10) being coated with a chromium-nitride coating (16). The coating (16) on the exterior margin of the piston pin (10) is shiftably matable with an inside margin of a pin bore (28) of a connecting rod (20) without the employment of an intervening bushing. [page 3, line 16 - page 4, line 11, Figs. 4-5]

The present invention further generally relates to a piston pin (10) and a connecting rod (20) combination comprising a piston pin exterior margin, the exterior margin having a coating (16) thereon comprised of chromium-nitride. The coating (16) on the exterior margin of the piston pin (10) is shiftably matable with an inside margin of a pin bore (28) of the connecting rod (20). A mating of the pin bore (28) with the piston pin is a shiftable surface-to-surface engagement without the employment of an intervening bushing. [page 3, line 16 - page 4, line 11, Figs. 4-5]

The present invention also generally relates to a method of forming a piston pin (10). The method includes forming a piston pin body (12) having an exterior margin, coating the exterior margin with a chromium-nitride material (16), forming the surface margin of a connecting rod (20) of a certain material, including the surface of a pin bore (28), and mating the coating (16) of the piston pin (10) with the surface of the pin bore (28) in a shiftable inside surface-to-surface engagement without the employment of an intervening bushing. [page 3, line 16 - page 4, line 11, Figs. 4-5]

**B. Examples from the specification are provided in support of the independent claims.**

1. A piston pin, comprising:	
a piston pin exterior margin, the exterior margin being coated with a chromium-nitride coating,	"The piston pin 10 has a generally tubular body 12." [p. 3, ln. 18]. "A coating 16 is applied to the external margin to the tubular body 12." [p. 3, ln. 20]. "The coating 16 is preferably chromium nitride (Cr-N)." [p. 4, ln. 3].
the coating being shiftably matable with an inside margin of a pin bore of a connecting rod without the employment of an intervening bushing.	"The small end 26 [of connecting rod 20] has a pin bore 28 defined therethrough . . . Notably, the interior margin of the pin bore 28 does not include a bushing . . ." [p. 3, ll. 26-27]. "Accordingly, the inside diameter of the pin bore 28 is in direct surface to surface contact with the coating 16 of the piston pin 10 when the piston pin 10 is inserted into the pin bore 28 of the connecting rod 20 without the interposition of a bearing." .p. 3, ln. 30 - p. 4, ln. 2]
8. A piston pin and a connecting rod combination comprising:	"The piston pin and connecting rod of the present invention are shown generally at 10 and 20 respectively . . . [p. 3, ll. 16-17].
a piston pin exterior margin, the exterior margin having a coating being comprised of chromium-nitride,	"The piston pin 10 has a generally tubular body 12." [p. 3, ln. 18]. "A coating 16 is applied to the external margin to the tubular body 12." [p. 3, ln. 20]. "The coating 16 is preferably chromium nitride (Cr-N)." [p. 4, ln. 3].
the coating being shiftably matable with an inside margin of a pin bore of the connecting rod, a mating of the pin bore with the piston pin being a shiftable surface to surface engagement without the employment of an intervening bushing.	"The small end 26 [of connecting rod 20] has a pin bore 28 defined therethrough . . . Notably, the interior margin of the pin bore 28 does not include a bushing . . . ." [p. 3, ll. 26-27]. "Accordingly, the inside diameter of the pin bore 28 is in direct surface to surface contact with the coating 16 of the piston pin 10 when the piston pin 10 is inserted into the pin bore 28 of the connecting rod 20 without the interposition of a bearing." [p. 3, ln. 30 - p. 4, ln. 2].

15. A method of forming a piston pin, comprising:	"The piston pin and connecting rod of the present invention are shown generally at 10 and 20 respectively . . . [p. 3, ll. 16-17].
forming a piston pin body having an exterior margin; coating the exterior margin with a chromium-nitride material; forming the surface margin of a connecting rod of a certain material, including the surface of a pin bore; and	"The piston pin 10 has a generally tubular body 12." [p. 3, ln. 18]. "A coating 16 is applied to the external margin to the tubular body 12." [p. 3, ln. 20]. "The coating 16 is preferably chromium nitride (Cr-N)." [p. 4, ln. 3].
mating the coating of the piston pin with the surface of the pin bore in a shiftable inside surface to surface engagement without the employment of an intervening bushing.	"The small end 26 [of connecting rod 20] has a pin bore 28 defined therethrough . . . Notably, the interior margin of the pin bore 28 does not include a bushing . . . ." [p. 3, ll. 26-27]. "Accordingly, the inside diameter of the pin bore 28 is in direct surface to surface contact with the coating 16 of the piston pin 10 when the piston pin 10 is inserted into the pin bore 28 of the connecting rod 20 without the interposition of a bearing." [p. 3, ln. 30 - p. 4, ln. 2].

## VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 8 and 10-14 stand rejected under 35 U.S.C. 112, second paragraph. Claims 1, 3, 4, 6, and 7 stand rejected under 35 U.S.C. 102(b) in view of Komuro et al. (U.S. Patent No. 5,851,659). Claim 5 stands rejected under 35 U.S.C. 103(b) in view of Komuro. Claims 8, 10, and 15 stand rejected under 35 U.S.C. 103(a) under McKone (U.S. Patent No. 1,491,155) in view of Kochendorfer et al. (U.S. Patent No. 4,406,558). Claims 10-12 and 17-19 stand rejected under 35 U.S.C. 103(a) given McKone, in view of Kochendorfer, and further in view of Komuro. Claims 13 and 20 stand rejected under 35 U.S.C. 103(a) given McKone, in view of Kochendorfer and Komuro, and further in view of Fukutome et al. (U.S. Patent No. 5,601,293). Finally, claims 14 and 21 stand rejected under 35 U.S.C. 103(a) given McKone, in view of Kochendorfer, Komuro, and Fukutome, and further in view of Wakefield (U.S. Patent No. 3,757,378).

## VII. ARGUMENT

### A. Claims 8 and 10-14 stand rejected under 35 U.S.C. 112, second paragraph.

Claims 8 and 10-14 stand rejected as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellants regard as the invention. Specifically, with respect to claim 8, the Examiner indicated, "[I]t is unclear whether both the piston pin and the connecting rod comprise each a piston pin exterior margin."

The requirement to 'distinctly' claim means that the claim must have a meaning discernible to one of ordinary skill in the art. *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1366, (Fed. Cir. 2004). "Only when a claim remains insolubly ambiguous without a discernible meaning after all reasonable attempts at construction must a court declare it indefinite." *Id.* "Some latitude in the manner of expression and the aptness of terms should be permitted even though the claim language is not as precise as the examiner might desire." MPEP 2173.02.

The claim term "piston pin exterior margin" is clear. While the preamble includes combination of a piston pin and a connecting rod, the interplay between the coating on the piston pin exterior margin and the pin bore of the connecting rod is clear based on the totality of the claim and the interaction of the claim limitations with each other. See MPEP 2173.02 citing *In re Larsen* No. 01-1092 (Fed. Cir. May 9, 2001) (unpublished) (court observed that the totality of all the limitations of the claim and their interaction with each other must be considered to ascertain the inventor's contribution to the art) (emphasis added).

In the present application, one of ordinary skill in the art would understand the term "piston pin exterior margin" to mean the exterior margin of the piston pin by the inclusion of the term "piston pin" in front of "exterior margin." One of ordinary skill in the art would not understand the term to mean that a connecting rod includes a "connecting rod" piston pin exterior margin, especially because "an inside margin" of the pin bore of the connecting rod is claimed. Because the connecting rod is specified as having "an inside margin", that inside margin is not and cannot be the "piston pin exterior margin". Thus, the claims are clear and have a meaning discernible to one of ordinary skill in the art.

For the foregoing reasons, claim 8 and claims 10-14 depending therefrom are not indefinite and do point out and distinctly claim the subject matter that Appellants regard as the invention, and comply with 35 U.S.C. § 112, second paragraph. Accordingly, Appellants respectfully request reversal of the rejection under 35 U.S.C. § 112, second paragraph.

**B. Claims 1, 3, 4, 6, and 7 stand rejected under 35 U.S.C. 102(b) in view of Komuro.**

Komuro teaches a test roller (11) having a test piece (13) disposed thereon. The test piece (13) has a coating deposited thereon. A load roller (12) is used to measure wear characteristics of the coating material on the test piece (13). Komuro does not teach a piston pin, as claimed in claim 1, and therefore cannot anticipate claim 1 or any claims that depend therefrom.

The Examiner contends that FIG. 3 of Komuro shows a piston ring having an external margin (13). Applicant notes that the wear resistant coating of Komuro is deposited onto the test piece (13) and not on the test roller (11). Even if one were to construe the test roller (11) of Komuro as a piston pin, and the load roller (12) as the connecting rod pin bore mating surface, one would still not be considering a piston pin that is *shiftablely matable with an inside margin on a pin bore of a connecting rod without the employment of an intervening bushing*, as stated in claim 1, because the test piece (13) of Komuro acts as a bushing that separates the test roller (11) from the load roller (12). Alternatively, one with skill in the art would not consider a test piece, such as the test piece of Komuro, that is attached to a roller, as being a *piston pin* that is *shiftablely matable with an inside margin of a pin bore of a connecting rod* as stated in claim 1 because the test piece of Komuro is not a pin, but rather, is a test piece that is attached to the test roller [Komuro, column 7, lines 45-47].

Therefore, Komuro does not teach nor imply a piston pin having a chromium-nitride coating being coated on an exterior margin thereof, as stated in claim 1. Komuro teaches coating of a substrate with a compound containing chromium nitride having a columnar structure [see Abstract], but simply does not teach a piston pin nor any similar structure. Hence, claim 1 drawn to a piston pin is not anticipated by Komuro and may be passed to allowance. Further, claims 3, 4, 6, and 7 are allowable over Komuro because they depend on claim 1, which has been shown to be allowable. Appellants respectfully request reversal of the rejection of claims 1, 3, 4, 6, and 7 as being anticipated by Komuro.

**C. Claim 5 stands rejected under 35 U.S.C. 103(b) in view of Komuro.**

Applicants address the rejection of claim 5 under the assumption that the rejection cited by the Examiner as being under 35 U.S.C. 103(b) contains a typographical error as to the proper subsection of 35 U.S.C. 103 cited, and that the subsection intended to be used in

the rejection by the Examiner is 35 U.S.C. 103(a). The argument presented herein addresses the presumed rejection under 35 U.S.C. 103(a) based on the Komuro reference.

The Examiner rejected claim 5 under 35 U.S.C. § 103(a) in view of Komuro. The Examiner's rejection assumes that Komuro teaches all elements of independent claim 1 on which claim 5 depends, an assumption that has been shown to be incorrect above. The teachings of Komuro do not anticipate nor make obvious the claimed combination of claim 5 because even if one were to deposit a chromium-nitride coating *to a depth of substantially 5 microns* onto the test piece (13) of Komuro, one would not yield a *piston pin* having an *exterior margin being coated with a chromium-nitride coating* as stated in claim 1, and by dependence thereon, in claim 5.

A prima facie case of obviousness of Appellants' claimed invention requires the cited reference to teach, suggest, or motivate all of the features included in the claim standing rejected. In this case, a prima facie obviousness has not been established because all the elements of the rejected claim are not disclosed or suggested in the cited art. *In re Ochiai*, 37 USPQ 1127, 1131 (Fed. Cir. 1995). ("The test for obviousness *vel non* is statutory. It requires that one compare the claim's 'subject matter as a whole' with the prior art 'to which said subject matter pertains.'"); see also MPEP 2143.03 "All Claim Limitations Must Be Taught or Suggested," citing *In re Royka*, 180 USPQ 580 (CCPA 1974). "To establish prima facie obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art." MPEP 2143.03.

Therefore, Komuro cannot anticipate the combination of claim 5 because Komuro fails to anticipate all the limitations of the intervening independent claim 1 as shown. Hence, claim 5 is not obvious in view of Komuro and may be passed to allowance.

**D. Claims 8, 10, and 15 stand rejected under 35 U.S.C. 103(a) given McKone in view of Kochendorfer.**

The Examiner points to FIG. 6 of McKone as illustrating a piston pin that connects to the piston bore without use of a bushing as the basis for the rejection. McKone mentions in his description that FIG. 6 shows "the usual piston 1 having therein a wrist pin 17 to which is connected in the usual manner a connecting rod 18" [page 4, lines 86-88] and goes on to explain that "[t]he end of the connecting rod bearing on the wrist pin has the usual cylindrical bearing thereon" [page 4, lines 89-91]. Therefore, McKone specifically teaches a cylindrical



bearing disposed at the interface between the piston pin and the connecting rod, even though he does not clearly show it. McKone in no way mentions, enables, or describes having a "wrist pin" that is connected to the connecting rod without use of a bearing. In fact, McKone teaches away from such a construction because he teaches use of a "usual cylindrical bearing" disposed between the wrist pin and the connecting rod.

Further, McKone teaches that "the upper end of the connecting rod clearly shown in Fig. 1 is provided with a semi-spherical bearing fitting over the bearing 5." [page 2, lines 34-37] such that "the rod 7 may have a slight rocking movement in relation to the piston." [page 2, lines 38-40]. Hence, McKone teaches away from having a *piston pin and connecting rod combination* that provides for a shiftably matable engagement *without the employment of an intervening bushing*, as stated in claims 8 and 15, because McKone teaches both a use of a bearing in the "usual" case of a shiftable cylindrical interface, and also teaches that the piston should be able to "rock" with respect to the pin and not "shift". Therefore, McKone, alone or in combination, cannot teach the limitations of the claims presented, and in fact teaches away from the claimed limitations. One of skill in the art would not construe McKone's teachings as teaching the claimed subject matter of the instant application.

Kochendorfer teaches a piston, or "gudgeon", pin that is made of a fibre-reinforced composite material that includes a metallic sliding bearing having a circular cylindrical external surface. The Examiner relies on Kochendorfer for his teaching of a coating deposition that includes Chromium.

A combination of the coating of Kochendorfer with the teachings of McKone, as combined by the Examiner, would yield a piston pin and connecting rod combination that either has a coated cylindrical bearing disposed between the two components, or, a combination having a coated semispherical bearing disposed between the two components. In either case, the resultant combination used by the Examiner in the rejection would not yield a *piston pin and connecting rod combination* that provides for a shiftably matable engagement *without the employment of an intervening bushing*, as stated in claims 8 and 15, because McKone teaches both a use of a bearing in the "usual" case of a shiftable cylindrical interface, and also teaches that the piston should be able to "rock" with respect to the pin and not "shift". A combination of the teachings of McKone with the coatings of Kochendorfer would fail to yield a device as claimed in the instant application.

The Examiner has made a 35 U.S.C. §103 rejection, yet has failed to provide the motivation as to why one of skill in the art would be motivated to make such a combination.

The Examiner's rejections have provided no more motivation than to simply point out the individual words of the Applicant's claims among the references, but without the reason and result as provided in the Applicant's claims and specification, and without reason as to why and how the references could provide the Applicant's invention as claimed. Therefore, the Examiner has provided mere hindsight as motivation, which is not sufficient to meet the burden of sustaining a 35 U.S.C. §103 rejection.

Thus, the claims of the present invention are not taught or suggested by McKone and/or Kochendorfer. Combining these references fails to teach or yield the invention as claimed. The combination of these references fails to teach or suggest all the elements of the claims. Further, one of skill in the art would not be motivated to make such a combination. Therefore, the present invention is not obvious in light of any combination of McKone and/or Kochendorfer.

Applicant also notes that the teachings of Kochendorfer generally point to a genus group for metals suitable for use in his coating layer that includes numerous elements, specifically, coatings including metals belonging within the third, fourth, fifth, or sixth groups in the periodic table of elements, and does not specifically teach use of Chromium. Even though Chromium is a species in the genus, the Examiner has failed to establish a prima facie case of obviousness because "a determination must be made whether one of ordinary skill in the relevant art would have been motivated to make the claimed invention as a whole, i.e., to select the claimed species or subgenus from the disclosed prior art genus." *In re Ochiai*, 71 F.3d at 1569-70, that includes consideration of the size of the genus, the express teachings of the reference, the teachings of structural similarity, the properties and utilities of any structurally similar prior art species or subgenus, the predictability of the technology, and any other teaching to support the selection of the species or subgenus. *Id*

The genus taught by Kochendorfer includes numerous elemental metals, each of which has unique properties and utilities. While Kochendorfer teaches the genus of "the metals in the third to sixth group of the periodic table," it does not teach any species or any structural similarities of species or subgenus within the genus. Accordingly, because Kochendorfer does not disclose any species in the genus or any properties and utilities of any structurally similar prior art species or subgenus, it would not have been obvious to select chromium-nitride as the disclosed "nitride, boride, and/or silicide."

**E. Claims 10-12 and 17-19 stand rejected under 35 U.S.C. 103(a) given McKone, in view of Kochendorfer, and further in view of Komuro.**

The Examiner rejected claims 10-12 and 17-19 under 35 U.S.C. § 103(a) as being unpatentable over McKone in view of Kochendorfer and Komuro. The Examiner relies on the combination of McKone and Kochendorfer for teaching the subject matter of the independent claims 8 and 15, and adds to the combination the vapor deposition techniques of Komuro to perfect the claimed combinations of the dependent claims rejected, namely, claims 10-12 and 17-19.

As Applicant has shown above, the combination of McKone and Kochendorfer does not yield a *piston pin and connecting rod combination* that provides for a shiftably matable engagement *without the employment of an intervening bushing*, as stated in independent claims 8 and 15. A further combination of Komuro for teaching a vapor deposition of a coating would not yield the claimed subject matter of claims 10-12 and 17-19, because the resultant combination of McKone, Kochendorfer, and Komuro still fails to teach the limitations of the independent claims. Because claims 8 and 15 are allowable, as shown above, claims 10-12 and 17-19 that depend therefrom are themselves allowable.

Moreover, to establish a prima facie case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. The Examiner has failed to establish such a prima facie case with respect to claims 10-12 and 17-19, as the Examiner has not pointed to any suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine reference teachings. Specifically, the Examiner has failed to point to any suggestion or motivation to coat the bearing of McKone or the gudgeon pins or Kochendorfer with the chromium-nitride coating taught by Komuro.

For this reason, a prima facie of obviousness has not been established and Appellants respectfully request reversal of the rejection of claims 10-12 and 17-19 as being obvious over McKone in view of Kochendorfer and Komuro.

**F. Claims 13 and 20 stand rejected under 35 U.S.C. 103(a) given McKone, in view of Kochendorfer and Komuro, and further in view of Fukutome.**

The Examiner relies on Fukutome for teaching or suggesting buffing of a chromium-nitride deposition (citing col. 7, line 18-21). Fukutome teaches forming a hard film on an outer circumferential surface of a piston ring, and then performing a test on the physical wear characteristics of the hard film using a reciprocating friction testing machine shown in FIG. 8. The reciprocating friction testing machine reciprocates a test piece having the hard film deposited thereon onto a lower test piece. The lower test piece has no hard film depositions thereon and is used to simulate a mating part, in this case, an inner bore of a cylinder wall in a crankcase.

Fukutome teaches that the lower test piece, not the coated piece, is buff-polished to yield a uniform surface roughness [col. 7, lines 18-21]. Therefore, Fukutome fails to teach that *the chromium-nitride coating is buffed after deposition*, as stated in claim 13, nor does he teach *buffing the chromium-nitride coating after deposition*, as stated in claim 20. Buff-polishing of non coated components is known. Fukutome does not teach buff-polishing of chromium nitride deposits. One with ordinary skill in the art would not construe the buff-polishing of a non coated part, the test piece, in Fukutome as a teaching for buff-polishing of a chromium-nitride coating, especially because Fukutome does teach such a coating for a piston ring, and does not teach buff-polishing of the coating, but rather chooses to buff-polish the lower test piece instead, effectively teaching away from buff-polishing the coating itself.

Therefore, the combination of McKone, Kochendorfer, Komuro, and Fukutome does not teach nor imply the claimed subject matter of claims 13 and 20. Further, claims 13 and 20 depend respectively on claims 8 and 15 which have already been shown to be allowable over the combination of McKone, Kochendorfer, and Komuro. Hence, Appellants respectfully request reversal of the rejection of claims 13 and 20 as being obvious over McKone in view of Kochendorfer, Komuro, and Fukutome.

**G. Claims 14 and 21 stand rejected under 35 U.S.C. 103(a) given McKone, in view of Kochendorfer, Komuro, and Fukutome, and further in view of Wakefield.**

Applicants have already shown that the combination of McKone in view of Kochendorfer, Komuro, and Fukutome fails to teach or imply the limitations in the claimed combinations that intervene claims 14 and 21, specifically, the combinations of claims 13 and 20 on which claims 14 and 21 depend on respectively. Because claims 13 and 20 are allowable, claims 14 and 21 that depend therefrom are also allowable. The combination of the center-less buffing teachings of Wakefield with McKone, Kochendorfer, Komuro, and Fukutome still fails to teach all elements of the claims, as already shown, because McKone in view of Kochendorfer fails to teach a coated piston pin that connects to a connecting rod without a bushing, Komuro fails to teach a piston pin with coating deposited directly thereon, and Fukutome fails to teach polishing of a coating. Therefore, the center-less buffing of Wakefield fails to yield the invention as claimed.

Hence, Appellants respectfully request reversal of the rejection of claims 14 and 21 as being obvious over McKone in view of Kochendorfer, Komuro, Fukutome, and Wakefield.

**H. Summary of Argument**

As shown above, claims 8 and 10-14 comply with the requirements under 35 U.S.C. §112, second paragraph. Komuro does support a 35 U.S.C. §102(b) of claims 1, 3, 4, 6, and 7. Komuro, Kochendorfer, Fukutome, Wakefield, and/or McKone fail to support a 35 U.S.C. §103(a) rejection, and the combination of Komuro, Kochendorfer, Fukutome, Wakefield, and/or McKone fails to teach or suggest all the elements and combinations of the claims, thus it would not be obvious to produce the invention as claimed from these references, and the 35 U.S.C. §103(a) rejections are not supported. Withdrawal of the rejections under 35 U.S.C. §112, second paragraph, 35 U.S.C. §102(b), and 35 U.S.C. §103(a), and a Notice of Allowance of claims 1, 3-8, 10-15, and 17-21 are hereby respectfully requested.

## VIII. CLAIMS APPENDIX

Claims 1, 3-8, 10-15, and 17-21 are involved in the appeal and are reproduced below.

1. A piston pin, comprising:  
  
a piston pin exterior margin, the exterior margin being coated with a chromium-nitride coating, the coating being shiftably matable with an inside margin of a pin bore of a connecting rod without the employment of an intervening bushing.
3. The piston pin of claim 1, the chromium-nitride coating being deposited by physical vapor deposition.
4. The piston pin of claim 1, the chromium-nitride coating being deposited to a depth of between 1 and 10 microns.
5. The piston pin of claim 4, the chromium-nitride coating being deposited to a depth of substantially 5 microns.
6. The piston pin of claim 1, the chromium-nitride coating being buffed after deposition.
7. The piston pin of claim 6, the chromium-nitride coating being buffed in a centerless buffing operation.

8. A piston pin and a connecting rod combination comprising:  
a piston pin exterior margin, the exterior margin having a coating being comprised of chromium-nitride, the coating being shiftably matable with an inside margin of a pin bore of the connecting rod, a mating of the pin bore with the piston pin being a shiftable surface to surface engagement without the employment of an intervening bushing.
10. The piston pin, connecting rod combination of claim 8, the chromium-nitride coating being deposited by physical vapor deposition.
11. The piston pin, connecting rod combination of claim 8, the chromium-nitride coating being deposited to a depth of between 1 and 10 microns.
12. The piston pin, connecting rod combination of claim 11, the chromium-nitride coating being deposited to a depth of substantially 5 microns.
13. The piston pin, connecting rod combination of claim 8, the chromium-nitride coating being buffed after deposition.
14. The piston pin, connecting rod combination of claim 13, the chromium-nitride coating being buffed in a centerless buffing operation.

15. A method of forming a piston pin, comprising:  
forming a piston pin body having an exterior margin;  
coating the exterior margin with a chromium-nitride material;  
forming the surface margin of a connecting rod of a certain material, including the  
surface of a pin bore; and  
mating the coating of the piston pin with the surface of the pin bore in a shiftable  
inside surface to surface engagement without the employment of an intervening  
bushing.
17. The method of claim 15 including depositing the chromium-nitride coating by physical  
vapor deposition.
18. The method of claim 15 including depositing the chromium-nitride coating to a depth  
of between 1 and 10 microns.
19. The method of claim 15, including depositing the chromium-nitride coating to a depth  
of substantially 5 microns.
20. The method of claim 15 including buffing the chromium-nitride coating after deposition  
prior to mating the exterior margin of piston pin with the inside margin of the pin.
21. The method of claim 20, including buffing the chromium-nitride coating in a centerless  
buffing operation.



## IX. EVIDENCE APPENDIX

No evidence has been submitted pursuant to 37 C.F.R §1.130, §1.131, or §1.132.

## X. RELATED PROCEEDINGS APPENDIX

No related proceedings are submitted herewith.

Respectfully submitted,

Date: February 21, 2007

By:



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